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Lætitia.

Mean Solar Time of Observation.		Apparent R.A.	Apparent N.P.D.
	h m s	h m s	° ′ ″
1857, June 1	11 31 34·8	16 13 8·12	95 7 8·68
2	11 26 49·2	16 12 18·31	95 5 32·04
8	10 58 23·6	16 7 27·37	94 59 7·99
12	10 39 37·9	16 4 24·88	94 57 50·19
13	10 34 58·0	16 3 40·72	94 57 54·50
15	10 25 41·4	16 2 15·76	94 58 25·64
17	10 16 27·9	16 0 53·80	94 59 36·76
22	9 53 42·6	15 57 47·54	95 5 9·12
23	9 49 12·6	15 57 13·39	95 6 41·51
24	9 44 43·9	15 56 40·52	95 8 21·48

On the Application of the Formulæ for Precession in the case of Stars near to the Pole; with a Correction of a trifling Error in the Table given by Mr. Baily in the Preface of the B.A. Catalogue. By R. C. Carrington, Esq.

In the exposition of the formulæ of Bohnenberger, given by Bessel in the *Tabulæ Regiomontanæ*, and elsewhere; although it has manifestly been the aim to attain the utmost brevity, it does not appear to have been noticed that the expressions for the auxiliary angles

$$(z+\lambda),\quad (z'-\lambda'),\quad \text{and } \theta,$$

may be given in formulæ involving only the times and constants, in all cases in which the tangent of the angle $\frac{1}{2}(\psi'-\psi)$ does not sensibly differ from its circular measure, cases which include all those commonly occuring. Thus, for Bessel's constants, if the star have to be brought from y to y', and $t=y-1750{\cdot}0$, and $t'=y'-1750{\cdot}0$,—

$$\begin{aligned} z+\lambda &= +23''{\cdot}0144\,(t'-t) - 0''{\cdot}0115\,(t'+t) - 0''{\cdot}000056\,.\,t'^2 - 0''{\cdot}000210\,.\,t^2 \\ z'-\lambda' &= +23{\cdot}0144\,(t'-t) + 0{\cdot}0115\,(t'+t) + 0{\cdot}000210\,.\,t'^2 + 0{\cdot}000056\,.\,t^2 \\ \theta &= +20{\cdot}0652\,(t'-t) \quad \ldots\ldots \quad - 0{\cdot}000048\,.\,t'^2 + 0{\cdot}000048\,.\,t^2 \end{aligned}$$

Expressed thus, we perceive at once that Mr. Baily has fallen into error in assuming, in page 40 of the Preface of the B.A.C., that for 1850·0 the values of $z+\lambda$ and $z'-\lambda'$ are each evanescent, as well as in stating that their variations are uniform. In fact, the differences are nearly constant, and for 1850·0 the terms $(z+\lambda)+(z'-\lambda')$ cancel one another. The oversight introduces a discontinuity in the values tabulated, which perplexed me, in

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following so careful a person as Mr. Baily, till I perceived the nature of his mistake. Although the error arising from his assumption would in most cases be exceedingly small, it may be worth while to give the table in a correct form.

Precession-Constants (Bessel's Elements).

From 1850·0 to	$(z + \lambda)$ ′ ″	$(z' - \lambda')$ ′ ″	θ ′ ″
1800	−19 14·69	−19 7·91	−16 42·90
1810	−15 24·72	−15 17·42	−13 22·30
1820	−11 34·76	−11 26·89	−10 1·71
1830	− 7 44·82	− 7 36·31	− 6 41·13
1840	− 3 54·88	− 3 45·70	− 3 20·56
1850	− 0 4·96	+ 0 4·96	0·00
1860	+ 3 44·95	+ 3 55·66	+ 3 20·55
1870	+ 7 34·85	+ 7 46·40	+ 6 41·09
1880	+11 24·74	+11 37·19	+10 1·62
1890	+15 14·62	+15 28·02	+13 22·15
1900	+19 4·49	+19 18·88	+16 42·66

It is plain that Mr. Baily computed the values for 1800 and 1900 correctly, and then went wrong as I have pointed out.

Some may now prefer using the constants, which result from the elements adopted by Peters, and given on page 71 of his *Num. Const. Nutations.* We then have (counting t and t' from 1800·0)

$$z + \lambda = +23''\cdot0311\,(t' - t) - 0''\cdot0000497\,.\,t'^2 - 0''\cdot0001922\,.\,t^2$$

$$z' - \lambda' = +23\cdot0311\,(t' - t) + 0\cdot0001922\,.\,t'^2 + 0\cdot0000497\,.\,t^2$$

$$\theta = +23\cdot0611\,(t' - t) - 0\cdot0000432\,.\,t'^2 + 0\cdot0000432\,.\,t^2$$

which furnish us with the following—

Precession-Constants by Peters' Elements.

From 1850 to	$(z + \lambda)$ ′ ″	$(z' - \lambda')$ ′ ″	θ ′ ″
1800	−19 12·03	−19 11·43	−16 42·94
1810	−15 21·73	−15 21·10	−13 22·35
1820	−11 31·43	−11 30·73	−10 1·76
1830	− 7 41·15	− 7 40·32	− 6 41·16
1840	− 3 50·87	− 3 49·88	− 3 20·57
1850	− 0 0·61	+ 0 0·61	0·00
1860	+ 3 49·65	+ 3 51·13	+ 3 20·56
1870	+ 7 39·89	+ 7 41·69	+ 6 41·11
1880	+11 30·13	+11 32·29	+10 1·66
1890	+15 20·35	+15 22·93	+13 22·20
1900	+19 10·57	+19 13·60	+16 42·73

It is to be regretted, in my humble opinion, that the use of these direct and exact formulæ is not commonly preferred to the use of secular variations derived by their expansion in series. It

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